

Figure 1

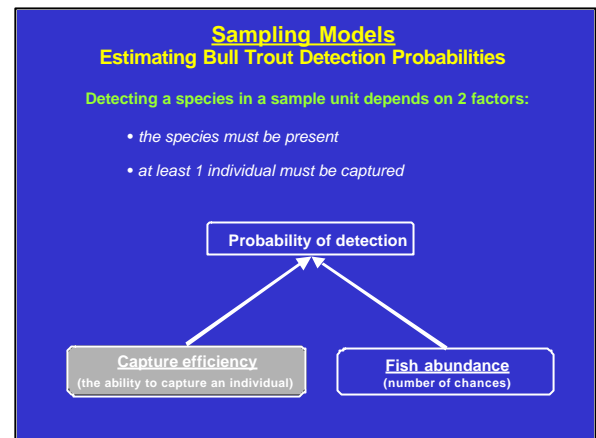


Figure 2

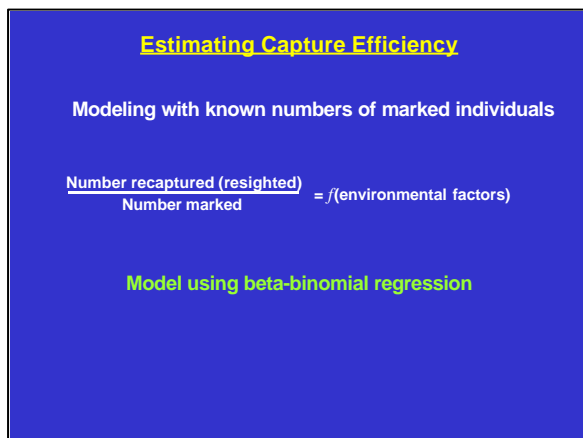


Figure 3

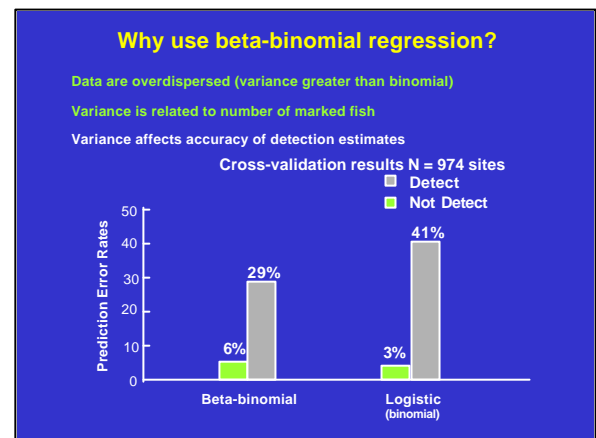


Figure 4

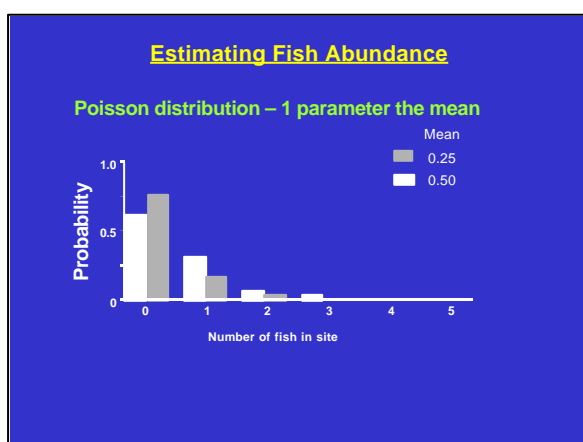


Figure 5

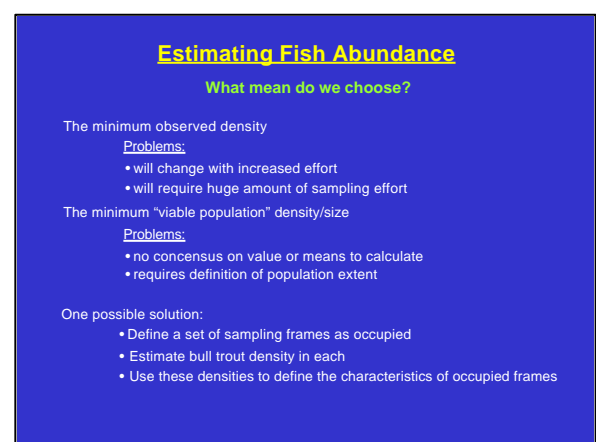


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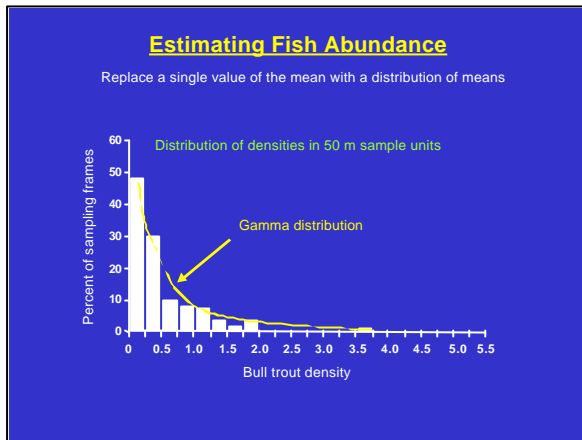


Figure 7

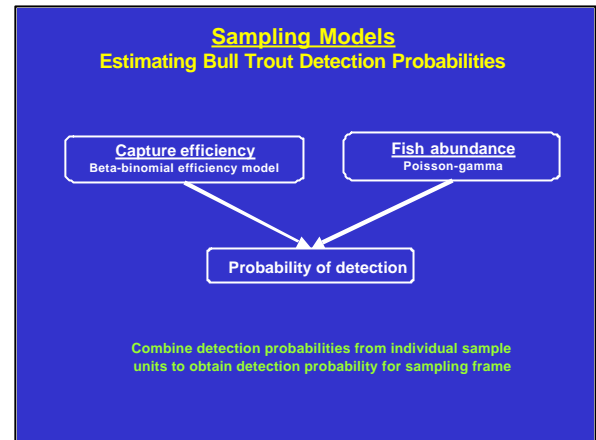


Figure 8

Interpreting a Zero Catch

The detection probabilities are **CONDITIONAL**

That is, they depend on the *condition*:
the sampling frame contains bull trout

Besides, were not interested in our ability to detect bull trout

We want to know:
what are the chances that bull trout are present,
given we haven't collected them

This is referred to as the **POSTERIOR** probability of presence

Figure 9

Posterior probability... who cares?

Consider the following...

A test for a disease has a 20% false positive error rate

We test 100 people **KNOWN** to be healthy

How many test positive?

20

Of these 20 that test positive, what percentage are healthy?

$\frac{20}{20} = 100\%$

So... there is a 100% chance that any given person is healthy
GIVEN THAT THEY TESTED POSITIVE

Figure 10

Posterior probability, continued

Same test always shows positive (100%) when someone HAS the disease

We test 1 person **KNOWN** to have the disease

What's the probability he tests positive?

100%

What's the probability that he is healthy?

ZERO

So... there is a 0% chance that he is healthy
GIVEN THAT HE TESTED POSITIVE

Figure 11

Posterior probability, continued

same test

We test 99 people **KNOWN** to be healthy, 1 KNOWN to be sick

How many test positive?
(round numbers)

21

Of these 21 that test positive, what percentage are healthy?

$\frac{20}{21} = 95\%$

So... there is a 95% chance that any given person is healthy
GIVEN THAT THEY TESTED POSITIVE

Figure 12

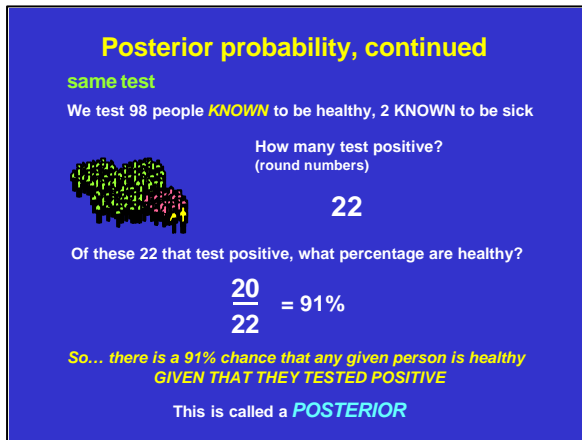


Figure 13

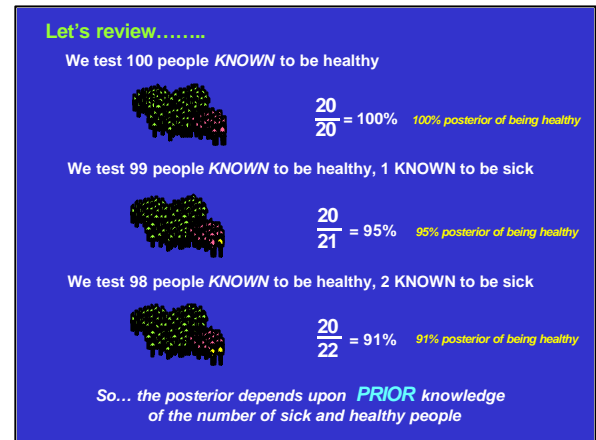


Figure 14

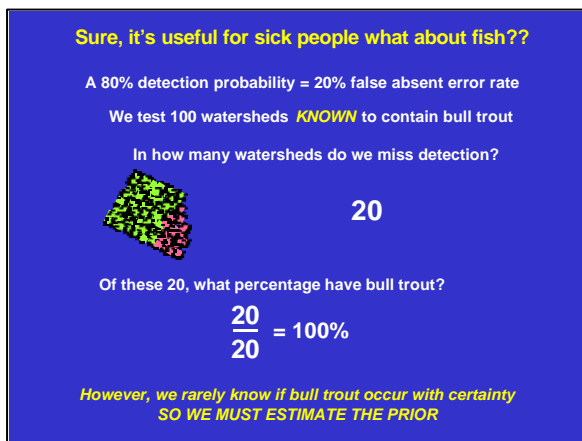


Figure 15

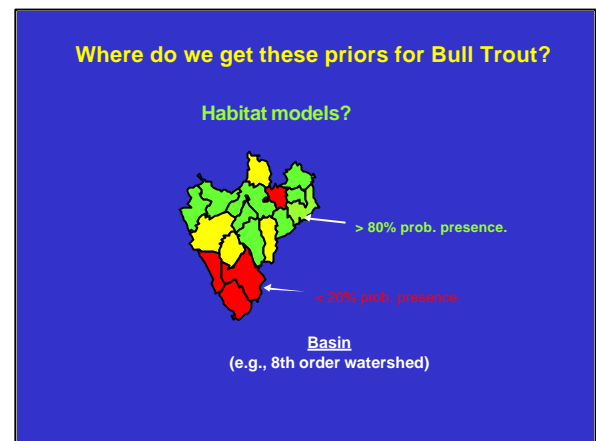


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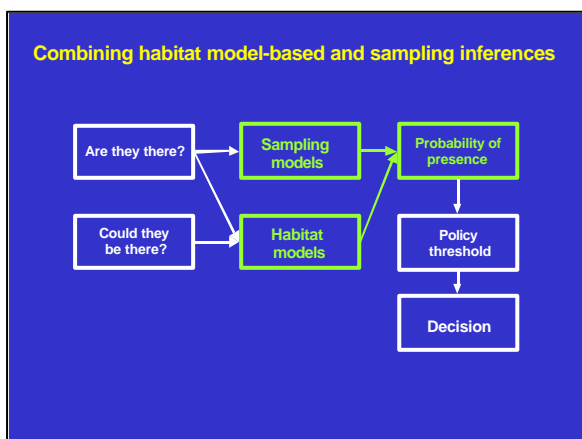


Figure 17

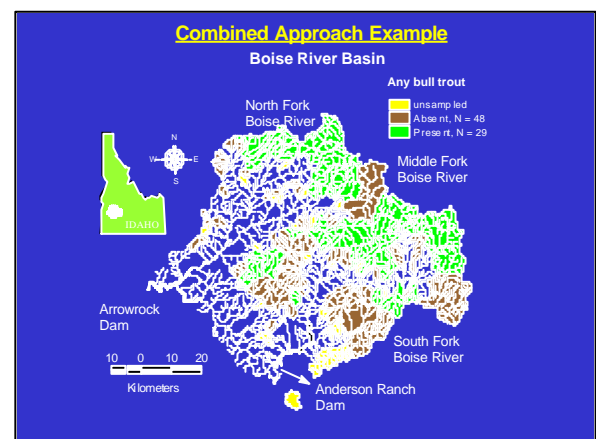


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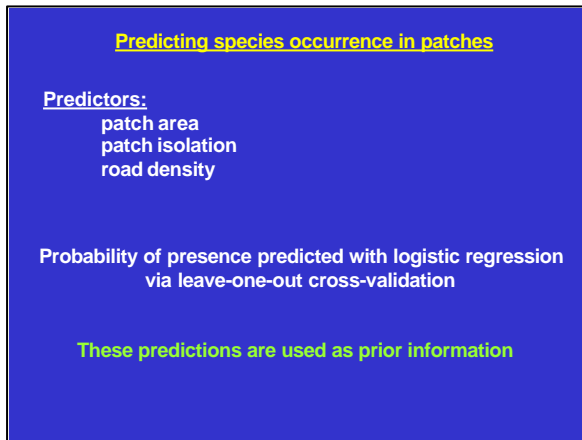


Figure 19

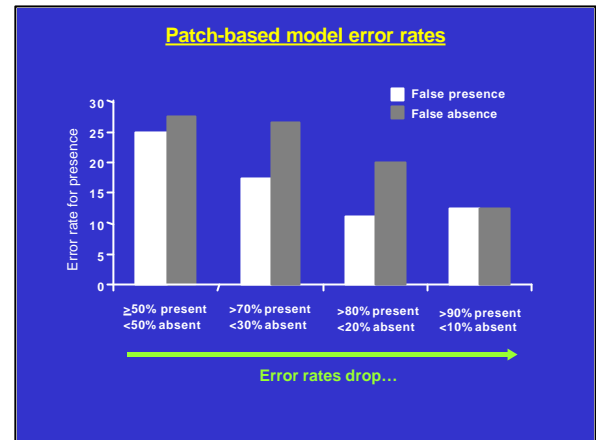


Figure 20

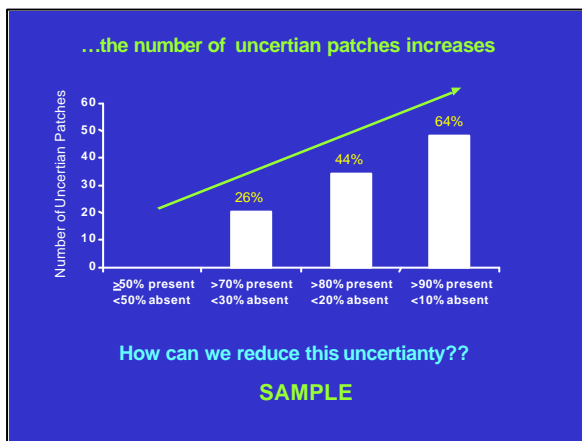


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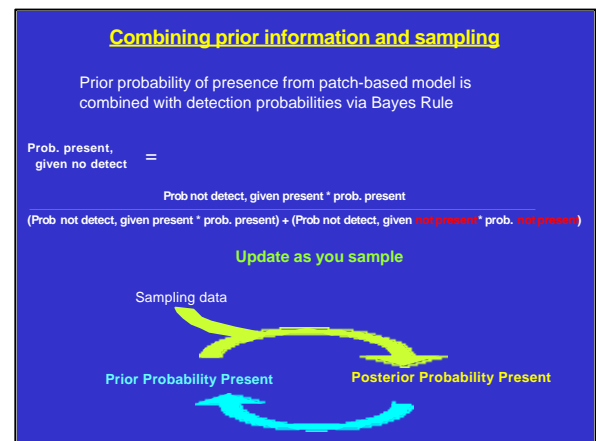


Figure 22

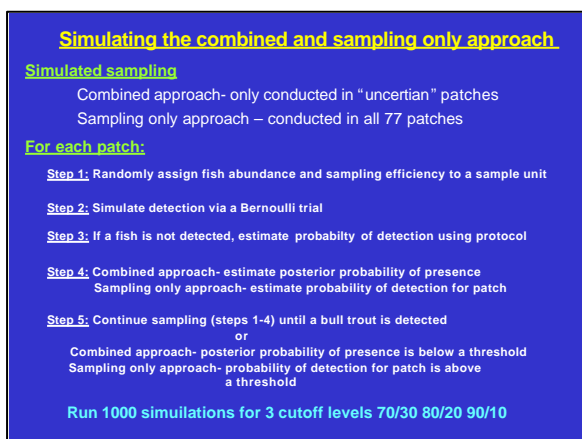


Figure 23

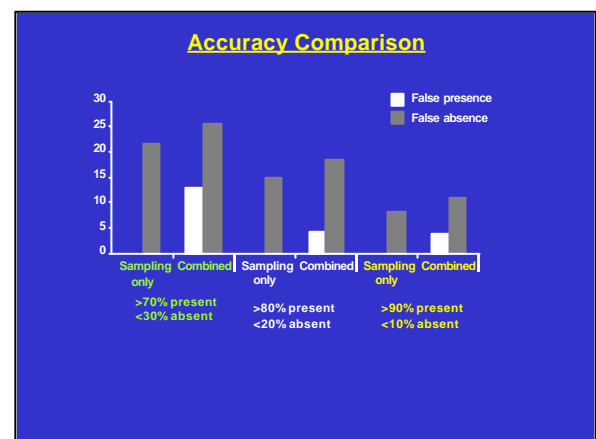


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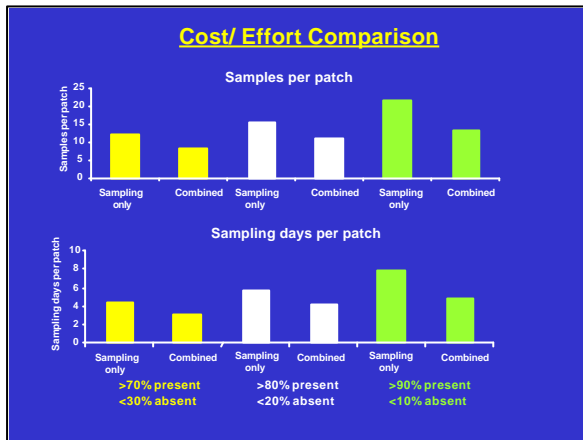


Figure 25

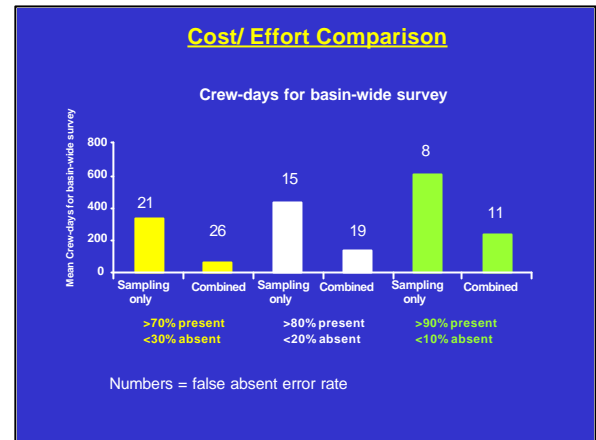


Figure 26

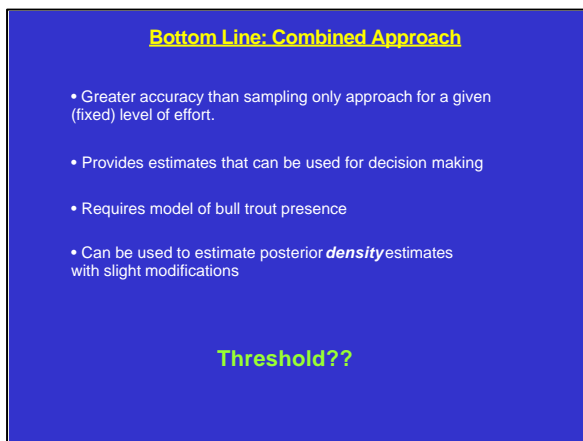


Figure 27